REMARKS

Claims 7, 10, 11, 13, 14, 16-20, and 24-26 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103 – RAVINOVITCH IN VIEW OF WHEATLEY

Claims 7, 10, 11, 13, 16, 17, 19, 20, and 24 are rejected under 35 USC 103(a) as being unpatentable over Ravinovitch et al. (US Pat. No. 4,424,292) in view of Wheatley et al. (US Pat. No. 5,233,465). This rejection is respectfully traversed.

Independent claims 7, 11, 16, 19, and 20 are to a film, article of architectural siding, coated article, and an article, each having an infrared reflective pigment in a sufficient amount so that there is essentially no transmittance of light of near infrared wavelength through the film or layer. The film can be about 1 mil to about 20 mils thick, from 2 mils to 5 mils thick, and can be a roll of film with a paper backing. The present invention also includes architectural siding and articles having a layer of poly(vinyl chloride) polymer, at least one plasticizer, and an infrared pigment in a sufficient amount so that there is essentially no transmittance of light of near infrared wavelength.

A skilled artisan would not find the present invention obvious in view of the Ravinovitch and Wheatley references. Ravinovitch discloses a reduction of heat buildup in a vinyl polymer composition by employing a black infrared reflecting pigment. However, "Ravinovitch does not teach the claimed thickness" of the present invention. Office Action from 02/27/2006, page 3. The addition of the Wheatley reference still does not disclose the film thickness of the present invention, as an individual layer in

Wheatley's multilayered film is only 0.0035 mil to 0.0177 mil. Moreover, Wheatley discloses an entirely different approach to reflect infrared light by using "a polymeric *multilayered film* made up of multiple alternating layers of diverse polymers." See col. 2, lines 53-55 (emphasis added); and see definition of "diverse" col. 2, lines 63-66. Wheatley's approach is therefore nonanalogous to the use of an infrared reflective pigment.

Specifically, the polymeric multilayered film in Wheatley contains multiple layers that differ in terms of refractive index, which is how the film reflects light in the infrared spectrum. See Wheatley col. 1, lines 17-19, 63-66. The number of layers can be varied from 50 to over 1000, changing the overall thickness of the multilayered film, but the reference relies on the differing refractive index of alternating layers to reflect infrared light. See Wheatley col. 2, lines 1-2; and see col. 4, lines 45-52.

Wheatley discloses that reflection and transmission spectra for a particular film are dependent on the optical thickness of the individual layers of a multilayer film. It is the change in refractive index between the layers that reflects light; there is no infrared reflecting pigment, nor is there any suggestion or motivation for changing a layer containing an infrared reflecting pigment. Reflection of infrared light by a reflective pigment is not the same mechanism as reflection afforded by multiple layers of diverse polymers, and one would expect no correlation between film thicknesses in view of the different mechanisms. Furthermore, a single layer of the multilayered film in Wheatley is 0.09 μm to 0.45 μm, which is only 0.0035 mil to 0.0177 mil. See Wheatley col. 4, line 49. Thus, there is a difference of several orders of magnitude between the present invention's films of about 1 mil to about 20 mils and about 2 mils to about 5 mils and the

Wheatley layers. The present invention is also not directed to a multilayered film of diverse polymers. As a result, no combination of Ravinovitch with Wheatley would produce or suggest the present invention.

In addition to the preceding argument, Applicant again asserts that the amount of infrared reflective pigment used in the Ravinovitch reference and the present invention are not comparable, and any combination of the aforementioned references fails to disclose an infrared-reflective pigment in a sufficient amount so that there is essentially no transmittance of light of near infrared wavelength. Ravinovitch discloses that "the black pigment should be used at an effective level, based on the weight of the vinyl polymer or polymers in the composition." See Ravinovitch col. 4, lines 40-42; and see claim 1. In contrast, the present invention provides essentially no transmittance of light of near infrared wavelength. The Office Action "concedes there is no explicit teaching of said limitations, but takes the position such a limitation is rendered obvious by Ravinovitch." See Office Action 02/27/2006, page 5.

The goals of the Ravinovitch reference and the present invention are different. For example, Ravinovitch is directed toward pigments which would reflect infrared energy and which would lower the heating of the article without changing the ultraviolet protection or the color thereof. See Ravinovitch col. 1, lines 64-68. Ravinovitch is searching for a balance, and Ravinovitch uses an effective amount of pigment to lower heat in achieving this balance between IR reflection, UV protection, and color. Thus, Ravinovitch does not provide any suggestion or motivation to use an amount of pigment to provide essentially no transmittance of light of near infrared wavelength. Accordingly, the present invention is not an optimization of the amount of pigment of Ravinovitch.

Instead the present invention expressly uses an IR reflective pigment in a sufficient amount so that there is essentially no transmittance of light of near infrared wavelength through the film. Withdrawal of the rejection and reconsideration are respectfully requested.

REJECTION UNDER 35 U.S.C. § 103 – RAVINOVITCH IN VIEW OF WHEATLEY AND SULLIVAN

Claims 14 and 18 are rejected under 35 USC 103(a) as being unpatentable over Ravinovitch et al. (US Pat. No. 4,424,292) and in view of Wheatley et al. (US Pat. No. 5,233,465) and Sullivan et al. (US Pat. No. 6,416,868). The rejection pertains to claims dependent on independent Claims 11 and 16. Claims 14 and 18 are patentable over the references, as the preceding arguments have demonstrated that Claims 11 and 16 are not obvious in view of the references, and hence all pending dependent claims are thereby not obvious. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Withdrawal of the rejection and reconsideration are respectfully requested.

REJECTION UNDER 35 U.S.C. § 103 – STAMPER

Claims 7, 10, 11, 13, 16, 17, 25, and 26 are rejected under 35 USC 103(a) as being obvious over Stamper et al. (US Pat. No. 4,574,103). This rejection is respectfully traversed.

The Stamper reference discloses a two-layer vinyl chloride laminate having a first layer containing titanium dioxide and a second layer containing antimony trioxide. The

first layer containing the titanium dioxide pigment improves the weatherability and resistance to sunlight, and the second layer contains antimony trioxide as a fire retardant. "The TiO_2 containing layer protects the Sb_2O_3 layer since in sunlight Sb_2O_3 adversely affects PVC." Stamper col. 1, lines 27-39.

Titanium dioxide is widely used for its efficiency in scattering visible light, and imparting whiteness, brightness, and high opacity when incorporated into a plastic formulation. Moreover, the ability of titanium dioxide to absorb UV light energy can provide significant improvement in the weatherability and durability of polymer products. See background on titanium dioxide in DuPont Titanium Technologies FAQ, available at http://www.titanium.dupont.com/NASApp/TTPORTAL/Mediator?action=2321&reference=102511328771#13; see also Ravinovitch col. 1, lines 51-57 (describes titanium dioxide as an ultraviolet light absorber, wherein UV absorption produces heat). The Stamper reference, therefore, appears to disclose the protection of an antimony trioxide vinyl chloride layer from UV absorption by blocking/absorbing UV light using a first layer of vinyl chloride containing titanium dioxide. Stamper does not mention or suggest reducing heat buildup; instead the reference is only interested in protecting the integrity of the fire retardant Sb_2O_3 vinyl chloride layer of the laminate.

Titanium dioxide, therefore, absorbs UV light and produces heat. This is contrary to the Office Action statement that it would be obvious to optimize the amount of titanium dioxide to increase the laminate's resistance to sunlight, and that such optimization would include sufficient amounts of an infrared-reflective pigment so that there is essentially no transmittance of light of near infrared wavelength through the film. See Office Action from 02/27/2006, page 5. Indeed, Stamper might teach optimization

of protection from the UV component of sunlight. But, Stamper does not disclose, suggest, or motivate a skilled artisan to re-engineer the Stamper laminate to contain an infrared-reflective pigment in a sufficient amount so that there is essentially no transmittance of light of near infrared wavelength through the film, as in the present invention. Withdrawal of the rejection and reconsideration are respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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